

REMARKS

Reconsideration of the pending application is respectfully requested on the basis of the following particulars:

1. Election/Restriction Requirement

With respect to the restriction/election requirement issued on January 8, 2010, and to the Examiner's withdrawal of claim 16, Applicant respectfully submits that claim 16 recites the features of claim 1 and additional structural limitations related to a steering mechanism, which affects the steering angles of the wheels. Hence, there is no basis for claim 16 to be withdrawn or for the restriction/election requirement. Should claim 1 be found allowable, Applicant would respectfully request claim 16 to be rejoined.

2. Rejection under 35 U.S.C. §103(a)

With respect to the rejection of claims 1-4 and 12-14 under 35 U.S.C. §103(a) as being obvious over Yanaka (JP 2004-175230) in view of Watanabe (JP 2001-030933) and Shimizu (US 5,729,107), Applicant respectfully traverses the rejection at least for the reason that Yanaka, Watanabe, and Shimizu, combined or separately, fail to teach, disclose, or suggest each and every limitation recited in the rejected claims.

In page 4, lines 12-15 of the Office Action, the Examiner contends that Shimizu cures the deficiencies of Yanaka and Watanabe by teaching the feature "wherein the steering control controller is configured to actuate the steering actuator such that the larger the detected steering angle with respect to a straight forward direction of the wheel, the slower the actuation speed of the steering actuator actuated by the steering controller ...". The Examiner cites claim 2 of Shimizu as support. However, in contrast to Applicant's claimed features, claim 2, as well as the specification, of Shimizu

discloses that the torque of the electric actuator is sharply reduced from a normal value when the detected steering angle is greater than the maximum permissible steering angle.

In general, Shimizu describes an electrical assist power control apparatus of an electric steering mechanism. In claim 2 of Shimizu, it is specified that when a steering angle is excessive (i.e., more than a maximum allowed angle), the electrical assist power is rapidly decreased, whereby an excessive steering action is suppressed.

Applicant respectfully submits that the torque of a steering actuator is not in any way equivalent to speed of the steering actuator. That is, Shimizu does not teach, disclose, or suggest the feature wherein the larger the detected steering angle, the slower the actuation speed of the steering actuator.

In Shimizu, the torque is adjusted so as to control the effort needed to turn the steering wheel under certain road conditions, such as slippery roads, for example. By reducing the power assist of the steering system, the operator of a vehicle is prevented from excessively steering the vehicle. Applicant respectfully submits that there is no relationship between controlling the actuation speed based on detected steering angle of the presently claimed invention and controlling the amount of torque output from the steering actuator to provide power steering assistance to the driver of the vehicle of Shimizu.

As submitted previously, it is an advantage of the presently claimed invention to include the actuation speed V of the steering cylinder (i.e. the steering speed) being varied in correspondence with the steering angle γ because of the structure of the steering mechanism, as shown in Fig. 13A. For example, as shown in Fig. 3, the apparatus comprises a steering mechanism having a pair of knuckle arms for swingably supporting a pair of the wheels to be steered around kingpin axes, and a tie rod for connecting the pair of knuckle arms, wherein the steering actuator is configured to drive the steering mechanism to change the steering angles of the wheels.

Due to the steering mechanism, for example, the steering angle γ varies slower in the middle range ($-\gamma' < \gamma < +\gamma'$), and the steering angle γ varies faster in the both side ranges ($\gamma > +\gamma'$ and $\gamma < -\gamma'$). Hence, to compensate for the differences in the steering

speed in accordance with the steering angle, the actuation speeds of the steering cylinder is controlled as mentioned above.

Again, in contrast to Applicant's controlling of the actuation speed based on detected steering angle in compensation for the geometry and structural characteristics of the steering mechanism, Shimizu relates to controlling the torque of the steering actuator in order to assist the driver by controlling how much effort is needed by the driver to steer the wheels under certain road conditions.

With respect to Watanabe, Applicant respectfully submits again that Watanabe generally describes to reduce the steering speed at the both ends of the steering angle (or range) to avoid a shock caused at the both ends. Specifically, as described in the abstract thereof, the electric power steering device of Watanabe provides a constantly light steering operation of a steering wheel and to reduce shock when the steering angle of the steering wheel reaches the maximum steering angle in the electric power steering device. Hence, Watanabe does not describe the feature wherein the steering control controller is configured to actuate the steering actuator such that the larger the detected steering angle with respect to a straight forward direction of the wheel, the slower the actuation speed of the steering actuator actuated by the steering controller, as recited in independent claims 1 and 16.

As previously submitted, Yanaka only discloses to regulate the travelling speed of the vehicle in accordance with an operational state of the steering operation device.

As Yanaka, Watanabe, and Shimizu, combined or separately, fail to teach, disclose, or suggest all of Applicant's claimed features as recited in pending independent claim 1 and its respective dependent claims 2-10 and 12-15, the reliance of Yanaka, Watanabe, and Shimizu in the obviousness rejection of the claims is improper.

In view of the arguments set forth above, Applicant respectfully requests reconsideration and withdrawal of the §103(a) rejection of claims 1-4 and 12-14.

With respect to claim 16, the arguments set forth above in relation to independent claim 1 are also applicable.

3. Rejection under 35 U.S.C. §102 or §103(a)

With respect to the §102 or in the alternative §103(a) rejection of claims 5-10 as being anticipated by or unpatentable over Yanaka, Watanabe, Kawashima (US 6,542,801) and Shimizu, and to the rejection of claim 15 under 35 U.S.C. §103(a) as being unpatentable over Yanaka, Watanabe, Tanaka and Shimizu, Applicant respectfully traverses the rejections at least for the reason set forth above in relation to the §103(a) rejection of independent claim 1.

With respect to the §102 rejection, Applicant respectfully submits that such a rejection is improper because claims 5-10 are dependent from claim 1, and that there is no §102 rejection of claim 1 set forth in the Office Action.

With respect to the obviousness rejections, Yanaka, Watanabe, Kawashima, Tanaka and Shimizu, combined or separately, fail to teach, disclose, or suggest the features wherein the steering control controller is configured to actuate the steering actuator such that the larger the detected steering angle with respect to a straight forward direction of the wheel, the slower the actuation speed of the steering actuator actuated by the steering controller, as recited in independent claims 1 and 16.

In view of the arguments set forth above, Applicant respectfully requests reconsideration and withdrawal of the rejections of claims 5-10 and 15.

4. Conclusion

In view of the amendments to the claims, and in further view of the foregoing remarks, it is respectfully submitted that the application is in condition for allowance. Accordingly, it is requested that claims 1-10 and 12-16 be allowed and the application be passed to issue.

If any issues remain that may be resolved by a telephone or facsimile communication with the Applicant's representative, the Examiner is invited to contact the undersigned at the numbers shown.

Further, while no fees are believed to be due, the Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 50-4525.

Respectfully submitted,

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